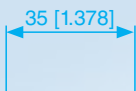


FRZ Series

Filter regulator, regulator

Perfect on lines following the removal of moisture and fluids!

Specialized **30 series**
for standalone applications

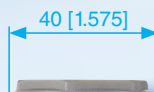


Regulator
RZ30



Filter regulator
FRZ30

The **40 and 50 series** can be used in combinations



Regulator
RZ40



Filter regulator
FRZ40



Regulator
RZ50



Filter regulator
FRZ50

Downsizing

Improved flow rate characteristics allow a smaller configuration (close side-by-side spacing possible).

Mounts in any direction

Elimination of fluid removal function for greater mounting direction freedom.

Improved operability and maintainability

Handle operability improved and bowl is easy to attach/remove.

Pressure gauge, pressure switch

Compatible with □30 [1.181] integrated pressure gauge, other types of pressure gauges, and pressure switches.

Compatible in a wide range of environments

Specifications for ozone resistance, NCU specifications (copper free)^{Note} compatible as standard.

Note: Excluding pressure switch and pressure gauge options.

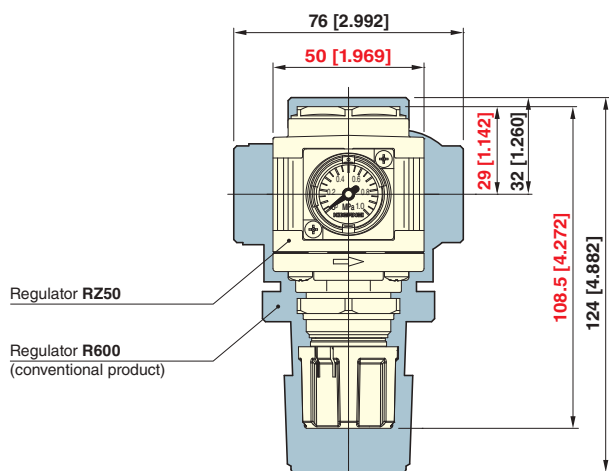


CAUTION Read the safety precautions on page 9 before using this product.

Compact design

Improved flow rate characteristics allow a smaller configuration.

* Comparison between our regulators **R600** and **RZ50**.



Improved handle operability

- The shape and size of the easy-to-operate handle make it light and smooth to turn. In addition, improving the resolution of the handle lock has reduced fluctuations in the set pressure when the handle is locked.
- The caution ring (yellow) allows you to check the state of the handle's lock as it is released.



Improved maintainability

- The bowl can be removed and attached in two easy steps. Filter elements can be easily replaced even in restricted maintenance spaces.
- Filter elements are nonwoven fabric filter elements. Increased porosity and circumferential area increase service life.



Improved freedom in mounting direction

Eliminated moisture and fluid removal function for greater mounting direction freedom. Mounting with the bowl part on the top or side is also possible.

Bowl part of filter

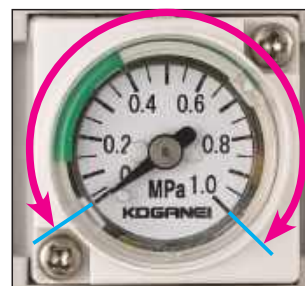


Filter regulator **FRZ40**

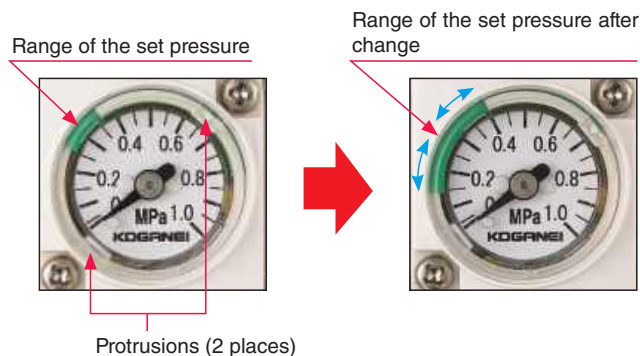
□30 [1.181] integrated pressure gauge

- □30 [1.181] integrated pressure gauge is compact with minimal protrusions. Plus, the easy-to-read display angle of 270° improves visibility.

Swing angle 270°



- The set pressure range (green area) can be changed as desired. The upper and lower limits of the setting range can be freely changed without removing the front cover (transparent resin part) or using tools.



By rotating the protrusions (two locations) clockwise or counter-clockwise, the display of the set pressure range can be changed as desired.

* Other pressure gauges and pressure switches are also available. For details, see the next page.

CMZ

IBCY
Positive
pressure
specifications

IBCY
Negative
pressure
specifications

FNZ
MFZ
MMFZ

FRZB

FRZ
RZ

Residual
pressure
exhaust
valve

Pressure
switch
module

Module
Adapter

Bracket

Pressure
gauge

Reference
material

Pressure gauge, pressure switch

Various pressure gauges and pressure switches can be selected in addition to the □30 [1.181] integrated pressure gauge.



φ40 [1.575] pressure gauge
(1 MPa [145 psi] specifications)



φ40 [1.575] pressure gauge
(0.3 MPa [44 psi] specifications)



φ40 [1.575] stainless steel bourdon
tube pressure gauge
(1 MPa [145 psi] specifications)



φ40 [1.575] stainless steel bourdon
tube pressure gauge
(0.3 MPa [44 psi] specifications)



Digital pressure switch
GS620
(1 MPa [145 psi] specifications)



Pressure gauge with built-in switch
(1 MPa [145 psi] specifications)

Pressure switch module

Easily detect line pressure with this compact pressure switch with integrated connection fitting. Plus, the set pressure can be adjusted from the front. For details, refer to page 144.

Note: Cannot be assembled to body size 30 series.



Residual pressure exhaust valve

Pressure in line can be exhausted by using a 3-port valve. The structure allows you to lock (with a keyhole) the valve in the residual pressure exhaust state, improving safety. In addition, the operation handle is a highly visible red handle. For details, refer to page 141.

Note: Cannot be assembled to body size 30 series.



Supplying air



Exhausting air



Keyhole

Module or adapter

Common to both the 40 and 50 series body sizes, these devices are used for connecting individual products, branch piping, and for variations in pipe sizes.

For details, refer to page 147.

Note: Cannot be assembled to body size 30 series.



F module
(For connector)



D module
(For connecting (with bracket))



T module
(For branch)



DT module
For branching (with bracket)



S adapter
(For pipe size conversion)



DS adapter
(For pipe size conversion, with bracket)



Module bracket
(For various modules and adapters)



Connector plate
(Replacement part)

Bracket

The brackets can be used with all sizes of the filter regulators and regulators.



Panel mount installation

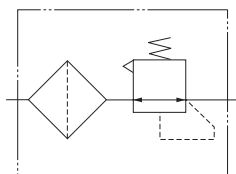
The hole diameter for a panel mount is standardized at φ28.5 mm [1.122 in.] for all sizes of filter regulators and regulators.

Filter regulator

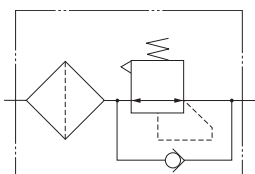
FRZ30·FRZ31·FRZ32
FRZ40·FRZ41
FRZ50·FRZ51



Symbols



- Standard
- For low pressure



- Built-in check mechanism

Specifications

Model		Standard	FRZ30	FRZ40	FRZ50
		For low pressure	FRZ31	FRZ41	FRZ51
		Built-in check mechanism	FRZ32	-	-
Item					
Media			Air		
Port size			M5×0.8, Rc1/8, Rc1/4	Rc1/8, Rc1/4, Rc3/8	Rc1/4, Rc3/8, Rc1/2
Maximum operating pressure MPa [psi]			1.0 [145]		
Proof pressure MPa [psi]			1.5 [218]		
Operating temperature range (atmospheric and medium) °C [°F]			5 to 60 [41 to 140] (non-condensation)		
Filtration μm			5		
Pressure regulating system			Direct acting/relief type	Internal pilot/relief type	
Set pressure range MPa [psi]	Standard/Built-in check mechanism		0.05 to 0.85 [7 to 123]		
	For low pressure		0.05 to 0.40 [7 to 58]		
Relief starting pressure MPa [psi]			Set pressure +0.05 [7] or less		
Materials used in major parts	Main unit		Die cast aluminum alloy		
	Bonnet & adapter		Polyacetal		
	Diaphragm		Base fabric + synthetic rubber		
	Bowl		Polycarbonate		
	Filter element		Nonwoven fabrics		
	Bracket		Steel plate (electroless nickel plated)		
Weight (for standard specifications and maximum port size) kg [lb]			0.16 [0.353]	0.20 [0.441]	0.29 [0.639]
Standard equipment			Mounting ring		
Options ^{Note}			□30 [1.181] integrated pressure gauge (combined), various other pressure gauges (included parts), bracket (included parts)		

Note: See page 151 and onward for individual product specifications or the order code column for details about each option.

Remarks: **FRZ4□** and **FRZ5□** are internal pilot types, so the secondary side consumes a small amount of air to adjust pressure.

Order Codes

FRZ □ - □ - □ - □

Main unit	Port size					
Model	M5	Rc1/8	Rc1/4	Rc3/8	Rc1/2	
30	M5	01	02			Standard
40		01	02	03		
50			02	03	04	For low pressure
31	M5	01	02			
41		01	02	03		Built-in check mechanism
51			02	03	04	
32	M5	01	02			

Filter regulator

- Order codes for brackets only

8Z-BK



Bracket

- Blank — No bracket
- B — With bracket

Pressure gauge specifications

- Blank — No pressure gauge (with pressure gauge connection port, Rc1/4)
- GP1 — No pressure gauge (with pressure gauge connection port, Rc1/8)
- GN — No pressure gauge (no pressure gauge connection port)
- G1C — 1 MPa [145 psi] specifications, □30 [1.181] integrated pressure gauge
- G4C — 0.4 MPa [58 psi] specifications, □30 [1.181] integrated pressure gauge
- G1 — 1 MPa [145 psi] specifications, φ40 [1.575] pressure gauge
- G3 — 0.3 MPa [44 psi] specifications, φ40 [1.575] pressure gauge
- G1S — 1 MPa [145 psi] specifications, φ40 [1.575] stainless steel bourdon tube pressure gauge
- G3S — 0.3 MPa [44 psi] specifications, φ40 [1.575] stainless steel bourdon tube pressure gauge
- GS6 — 1 MPa [145 psi] specifications, digital pressure switch
- GS1A — 1 MPa [145 psi] specifications □50 [1.969] pressure gauge with built-in switch, lead wire system, for 24 VDC
- GS1B — 1 MPa [145 psi] specifications □50 [1.969] pressure gauge with built-in switch, lead wire system, for 100 VAC, 200 VAC
- GS1C — 1 MPa [145 psi] specifications □50 [1.969] pressure gauge with built-in switch, with DIN system contacts, for 24 VDC
- GS1D — 1 MPa [145 psi] specifications □50 [1.969] pressure gauge with built-in switch, DIN system contacts, for 100 VAC, 200 VAC

Note: For specifications of pressure gauges, digital pressure switches, and pressure gauges with switches built in, order codes for individual purchases, and dimensions, see pages 154 to 161.

Order Codes

● Maintenance parts

● Bowl assembly

BA-FRZ ☐

Body size

30 — for FRZ3 ☐

40 — for FRZ4 ☐

50 — for FRZ5 ☐



● Element

E- ☐ **Z**

Body size

30 — for FRZ3 ☐

40 — for FRZ4 ☐

50 — for FRZ5 ☐



● Pressure port plate

P-FRZ (no pressure gauge connection port)



With 1 O-ring and
2 small screws

GP-FRZ ☐ (with pressure gauge connection port)



Port size

Blank — Rc1/4

1 — Rc1/8

With 1 O-ring and
2 small screws

● Seal kit (various O-rings, 1 valve assembly, 1 diaphragm assembly)

SRK-FRZ ☐

Body size

30 — for FRZ3 ☐

40 — for FRZ4 ☐

50 — for FRZ5 ☐

Refer to "Replacing the seal kit, element, and bowl assembly" on page 139 regarding the component parts of the seal kits.

● Handle

H-FRZ



● Mounting ring

R-FRZ



* Compatible brackets (to replace multi-series **FR15** ☐ • **FR30** ☐ • **FR60** ☐ filter regulators)

8Z-BK ☐

Body size

30 — **FR15** ☐ → replaced by **FRZ3** ☐

40 — **FR30** ☐ → replaced by **FRZ4** ☐

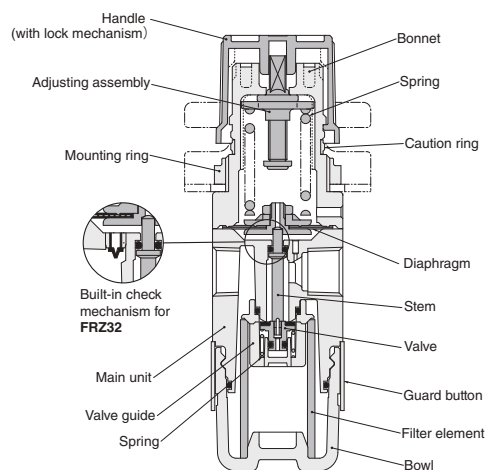
50 — **FR60** ☐ → replaced by **FRZ5** ☐



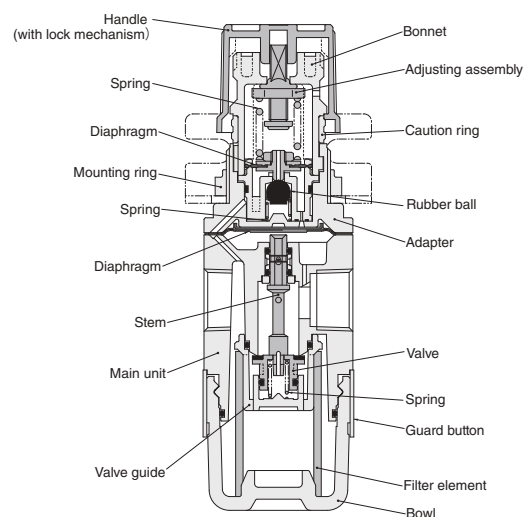
* For details, refer to pages 151 to 153.

Inner construction

FRZ3 ☐



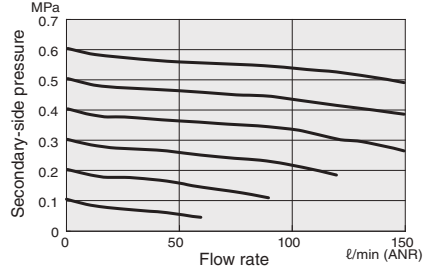
FRZ4 ☐ • **FRZ5** ☐



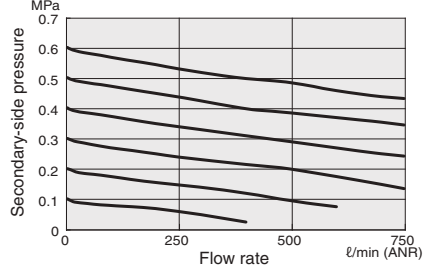
Flow rate characteristics

● Standard/Built-in check mechanism

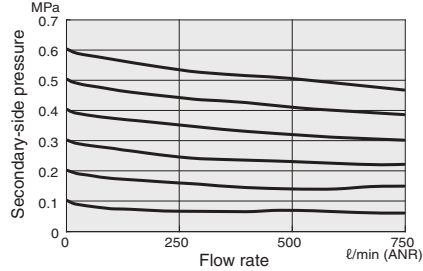
FRZ30-M5
FRZ32-M5



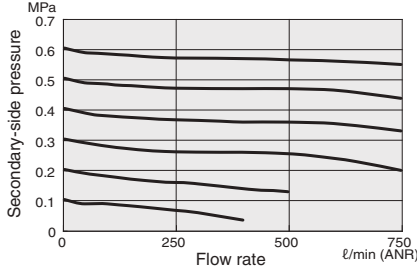
FRZ30-01
FRZ32-01



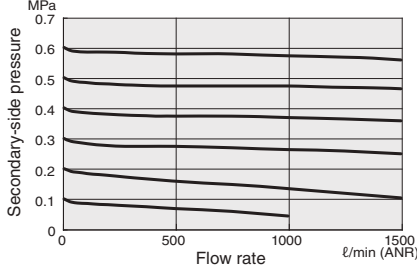
FRZ30-02
FRZ32-02



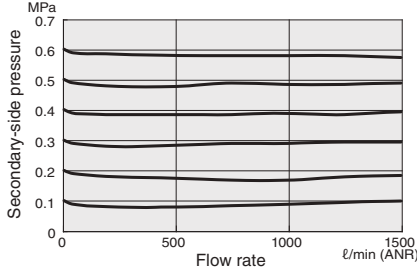
FRZ40-01



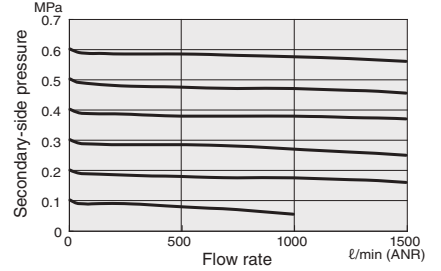
FRZ40-02



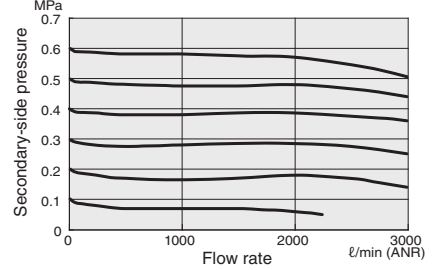
FRZ40-03



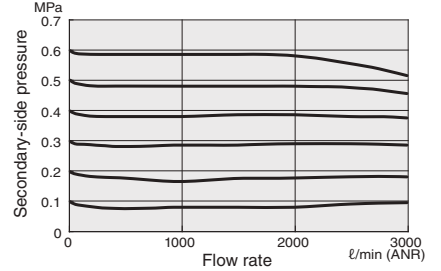
FRZ50-02



FRZ50-03



FRZ50-04

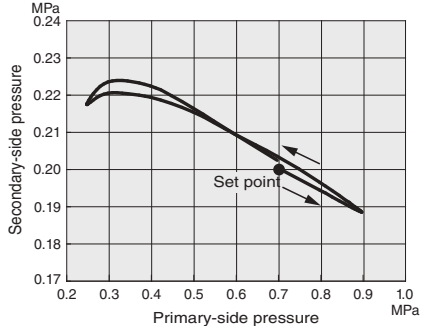


Remarks: Graphs show flow rate characteristics at constant primary-side pressure of 0.7 MPa [102 psi].

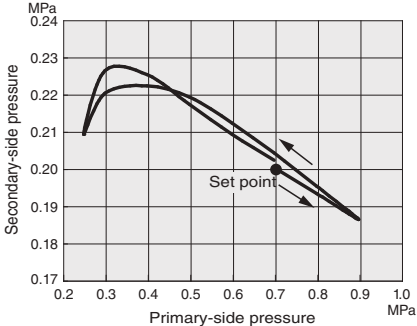
Pressure characteristics

● Standard/Built-in check mechanism

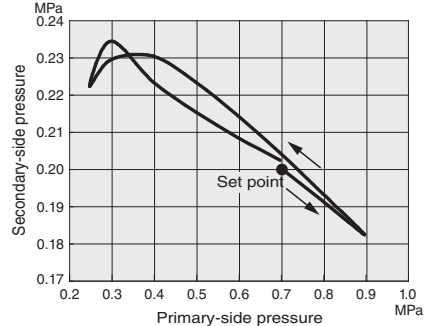
FRZ30
FRZ32



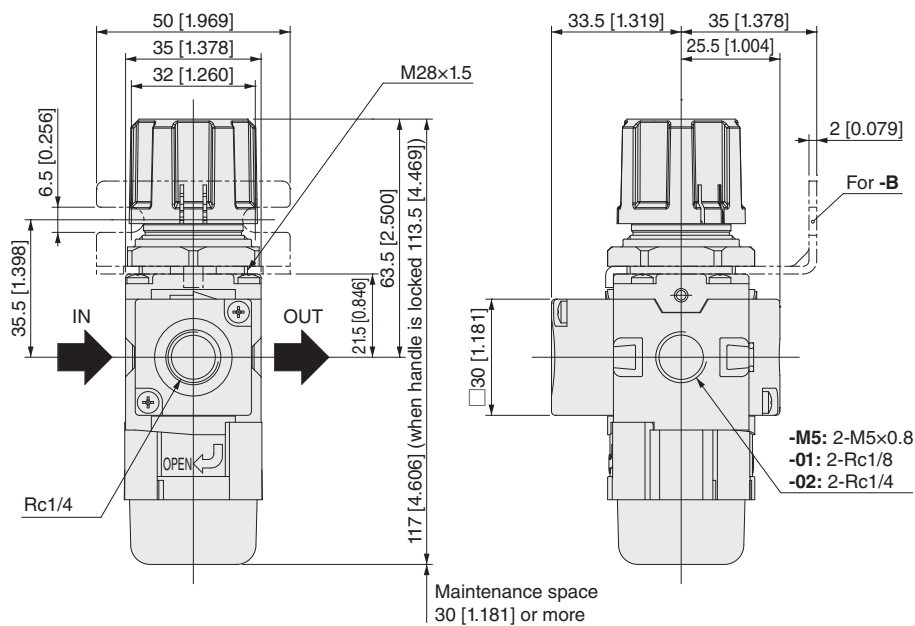
FRZ40



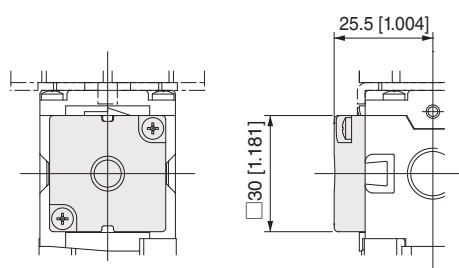
FRZ50



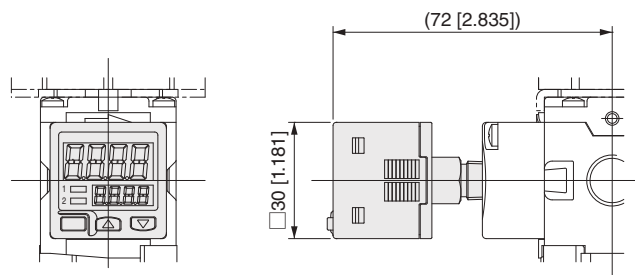
- FRZ30
- FRZ31
- FRZ32



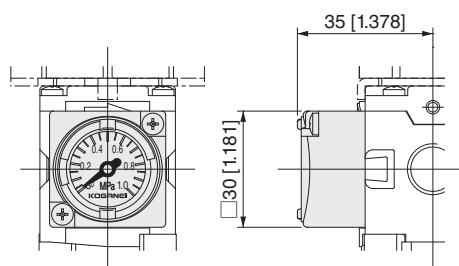
- Pressure gauge option



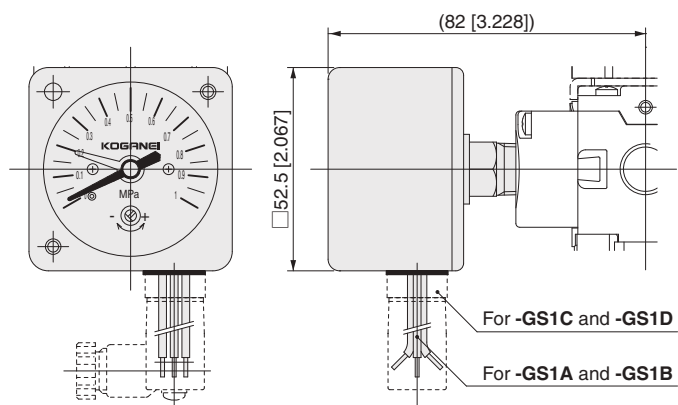
For -GN



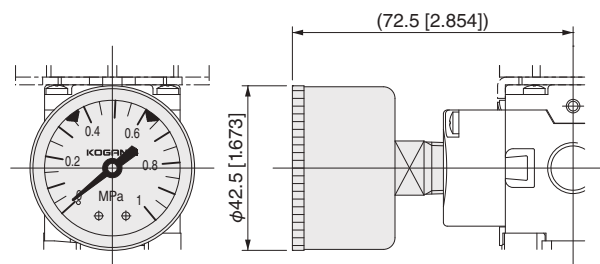
For -GS6



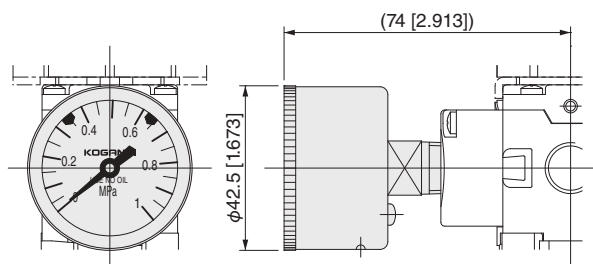
For -G1C, -G4C



For -GS1A, -GS1B, -GS1C and -GS1D

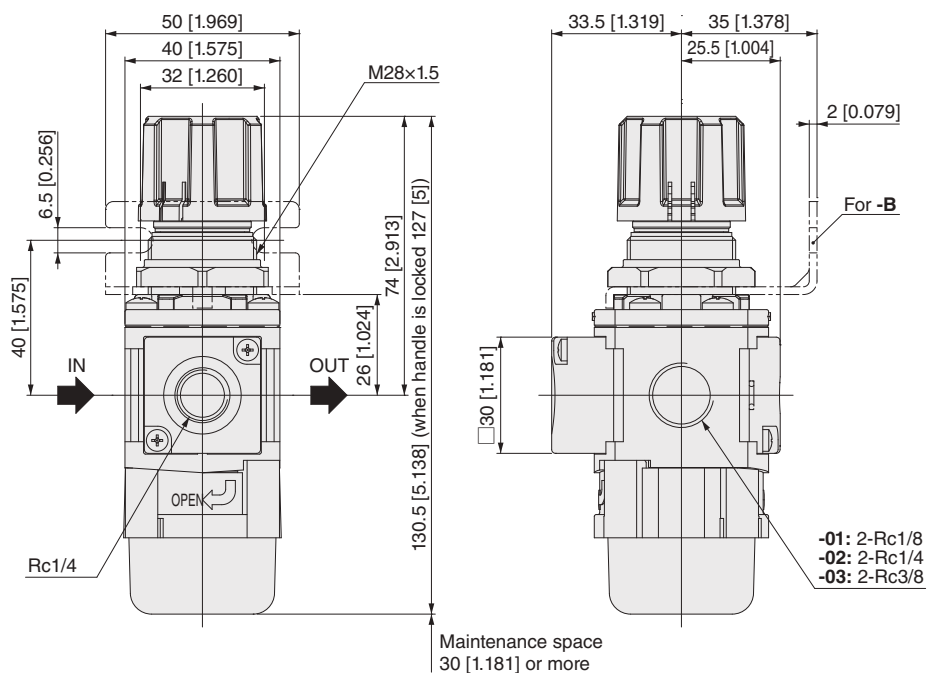


For -G1, -G3

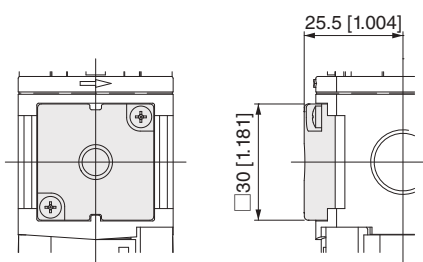


For -G1S, -G3S

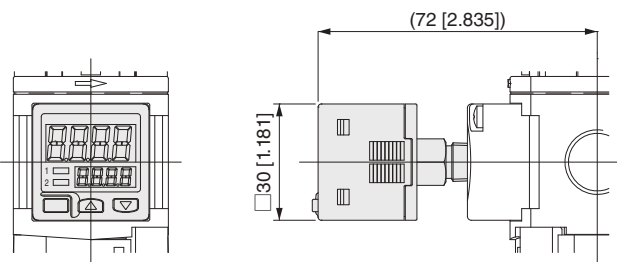
● FRZ40
● FRZ41



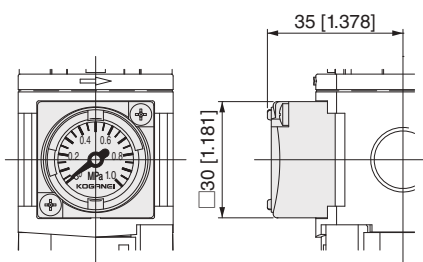
● Pressure gauge option



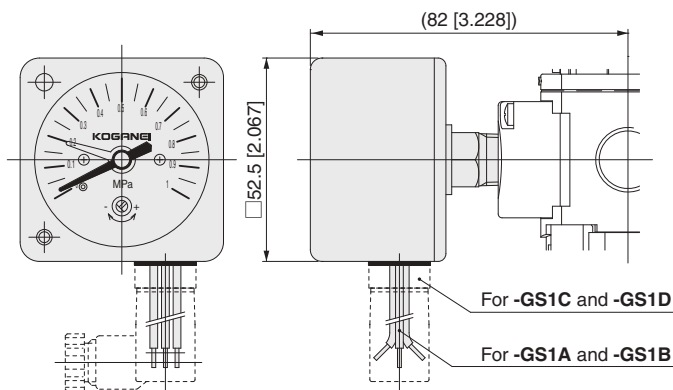
For -GN



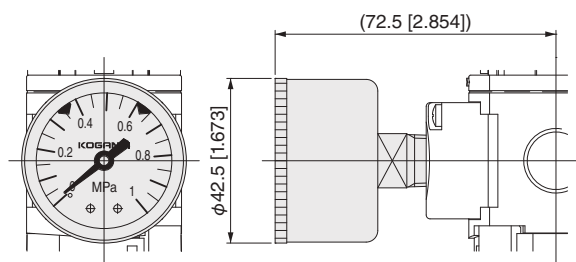
For -GS6



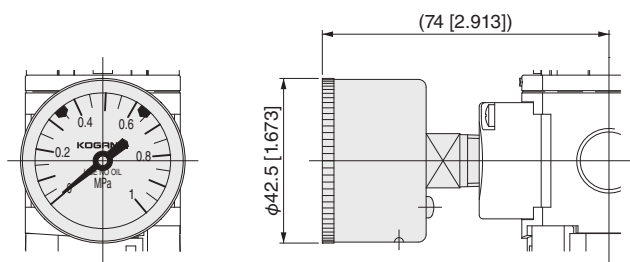
For -G1C, -G4C



For -GS1A, -GS1B, -GS1C and -GS1D



For -G1, -G3



For -G1S, -G3S

CMZ

IBCY
Positive
pressure
specifications

IBCY
Negative
pressure
specifications

FNZ
MFZ
MMFZ

FRZB

FRZ
RZ

Residual
pressure
exhaust
valve

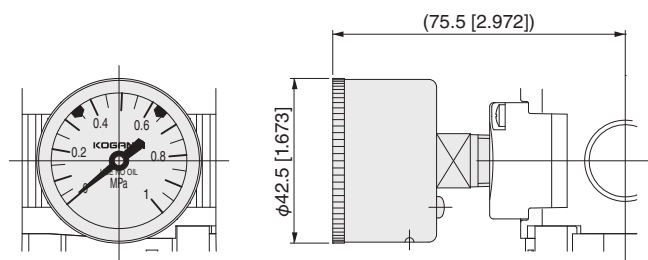
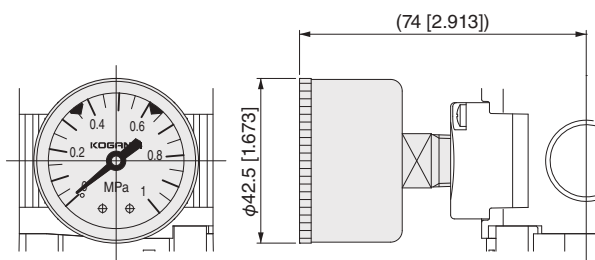
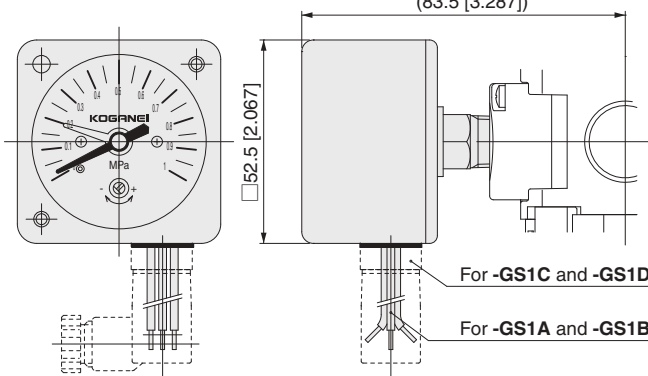
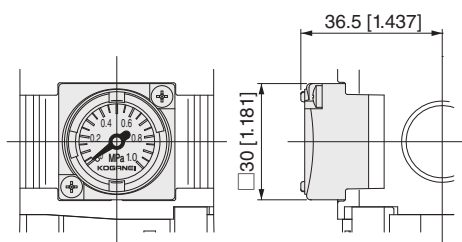
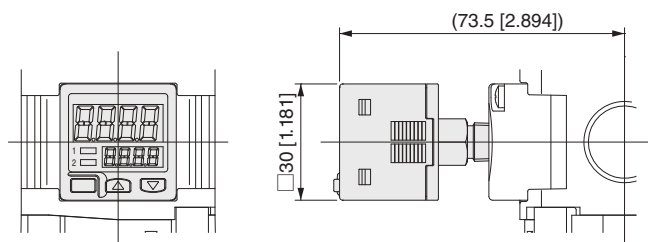
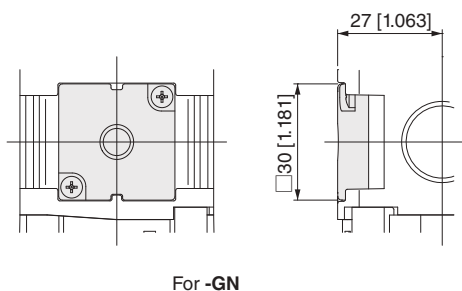
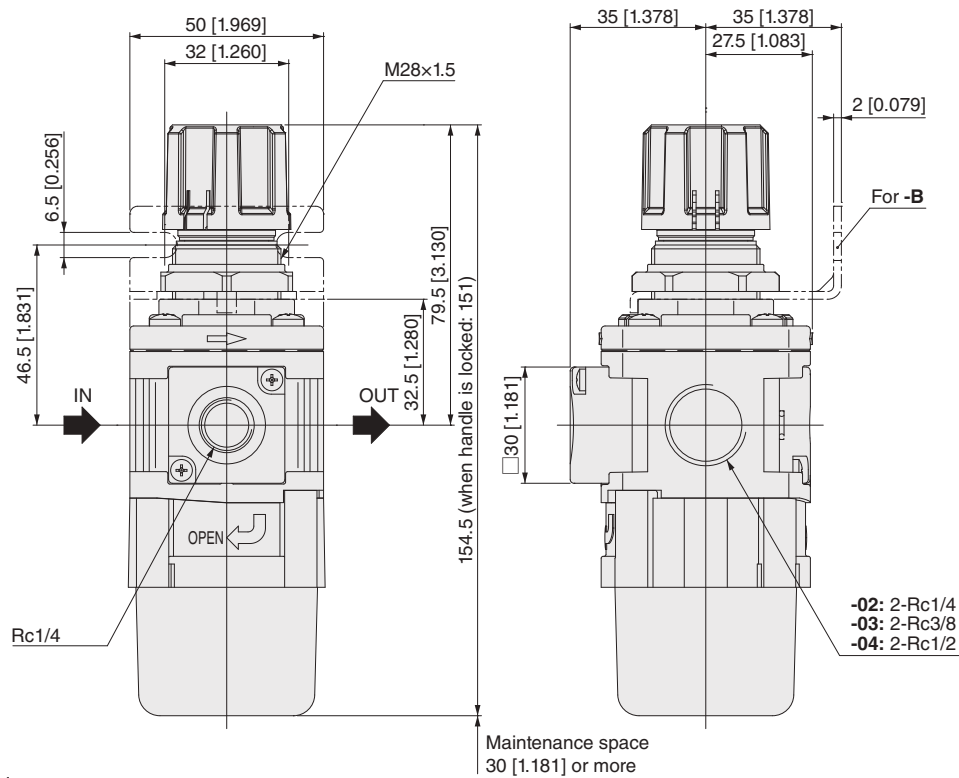
Pressure
switch
module

Module
Adapter

Bracket

Pressure
gauge

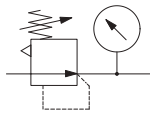
Reference
material

● **FRZ51**

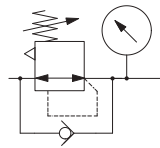
Regulator

RZ30·RZ31·RZ32
RZ40·RZ41
RZ50·RZ51

Symbols



- Standard
- For low pressure



- Built-in check mechanism

Specifications

Item	Model	Standard	RZ30	RZ40	RZ50
		For low pressure	RZ31	RZ41	RZ51
		Built-in check mechanism	RZ32	-	-
Media			Air		
Port size			M5x0.8, Rc1/8, Rc1/4	Rc1/8, Rc1/4, Rc3/8	Rc1/4, Rc3/8, Rc1/2
Maximum operating pressure MPa [psi]			1.0 [145]		
Proof pressure MPa [psi]			1.5 [218]		
Operating temperature range (atmospheric and medium) °C [°F]			5 to 60 [41 to 140] (non-condensation)		
Pressure regulating system			Direct acting/relief type	Internal pilot/relief type	
Set pressure range MPa [psi]	Standard/Built-in check mechanism		0.05 to 0.85 [7 to 123]		
	For low pressure		0.05 to 0.40 [7 to 58]		
Relief starting pressure MPa [psi]			Set pressure +0.05 [7] or less		
Materials used in major parts	Main unit		Die cast aluminum alloy		
	Bonnet & adapter		Polyacetal		
	Diaphragm		Base fabric + synthetic rubber		
	Bracket		Steel plate (electroless nickel plated)		
Weight (for standard specifications and maximum port size) kg [lb]			0.13 [0.287]	0.17 [0.375]	0.24 [0.529]
Standard equipment			Mounting ring		
Options ^{Note}			□30 [1.181] integrated pressure gauge (combined), various other pressure gauges (included parts), bracket (included parts)		

Note: See page 151 and onward for individual product specifications or the order code column for details about each option.

Remarks: **RZ4□** and **RZ5□** are internal pilot types, so the secondary side consumes a small amount of air to adjust pressure.

Order Codes

RZ □ — □ — □ — □

Main unit Port size

Model	M5	Rc1/8	Rc1/4	Rc3/8	Rc1/2
30	M5	01	02		
40		01	02	03	
50			02	03	04
31	M5	01	02		
41		01	02	03	
51			02	03	04
32	M5	01	02		

Standard

For low pressure

Built-in check mechanism

Bracket

Blank — No bracket

B — With bracket

Pressure gauge specifications

- Blank** — No pressure gauge (with pressure gauge connection port, Rc1/4)
- GP1** — No pressure gauge (with pressure gauge connection port, Rc1/8)
- GN** — No pressure gauge (no pressure gauge connection port)
- G1C** — 1 MPa [145 psi] specifications, □30 [1.181] integrated pressure gauge
- G4C** — 0.4 MPa [58 psi] specifications, □30 [1.181] integrated pressure gauge
- G1** — 1 MPa [145 psi] specifications, φ40 [1.575] pressure gauge
- G3** — 0.3 MPa [44 psi] specifications, φ40 [1.575] pressure gauge
- G1S** — 1 MPa [145 psi] specifications, φ40 [1.575] stainless steel bourdon tube pressure gauge
- G3S** — 0.3 MPa [44 psi] specifications, φ40 [1.575] stainless steel bourdon tube pressure gauge
- GS6** — 1 MPa [145 psi] specifications, digital pressure switch
- GS1A** — 1 MPa [145 psi] specifications □50 [1.969] pressure gauge with built-in switch, lead wire system, for 24 VDC
- GS1B** — 1 MPa [145 psi] specifications □50 [1.969] pressure gauge with built-in switch, lead wire system, for 100 VAC, 200 VAC
- GS1C** — 1 MPa [145 psi] specifications □50 [1.969] pressure gauge with built-in switch, with DIN system contacts, for 24 VDC
- GS1D** — 1 MPa [145 psi] specifications □50 [1.969] pressure gauge with built-in switch, DIN system contacts, for 100 VAC, 200 VAC

Note: For specifications of pressure gauges, digital pressure switches, and pressure gauges with switches built in, order codes for individual purchases, and dimensions, see pages 154 to 161.

Regulator

- Order codes for brackets only

8Z-BK



CMZ

IBCY
Positive
pressure
specifications

IBCY
Negative
pressure
specifications

FNZ

MFZ

MMFZ

FRZB

FRZ
RZ

Residual
pressure
exhaust
valve

Pressure
switch
module

Module
Adapter

Bracket

Pressure
gauge

Reference
material

Order Codes

● Maintenance parts

- Seal kit (various O-rings, 1 valve assembly, 1 diaphragm assembly)

SRK-RZ ☐

Body size

30 — for RZ3 ☐

40 — for RZ4 ☐

50 — for RZ5 ☐

Refer to "Replacing the seal kit, element, and bowl assembly" on page 139 regarding the component parts of the seal kits.

● Pressure port plate

P-FRZ (no pressure gauge connection port)



With 1 O-ring and
2 small screws

GP-FRZ ☐ (with pressure gauge connection port)



Port size

Blank — Rc1/4

1 — Rc1/8

With 1 O-ring and
2 small screws

● Handle

H-FRZ



● Mounting ring

R-FRZ



* Compatible brackets (to replace multi-series R15 ☐ · R30 ☐ · R60 ☐ regulators)

* For details, refer to pages 151 to 153.

8Z-BK ☐

Body size

30 — R15 ☐ → replaced by RZ3 ☐

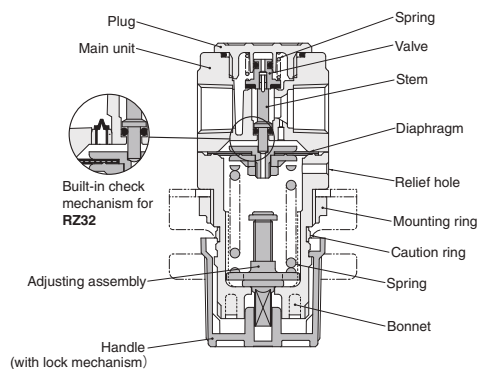
40 — R30 ☐ → replaced by RZ4 ☐

50 — R60 ☐ → replaced by RZ5 ☐

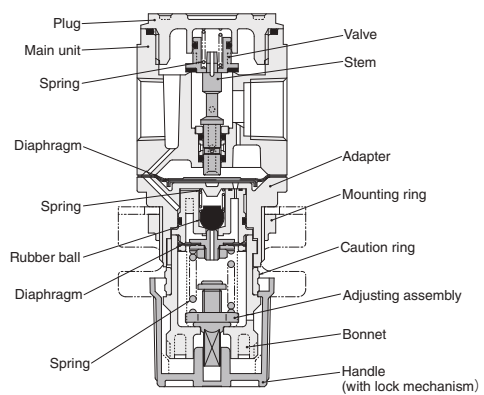


Inner construction

RZ3 ☐



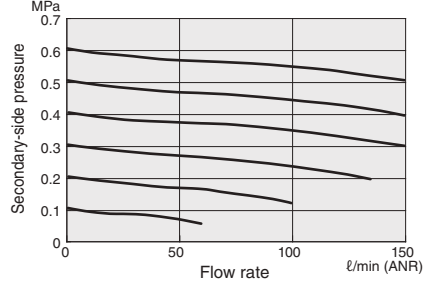
RZ4 ☐ · RZ5 ☐



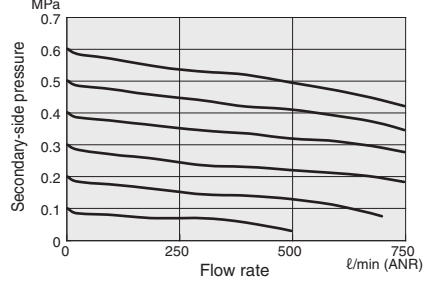
Flow rate characteristics

● Standard/Built-in check mechanism

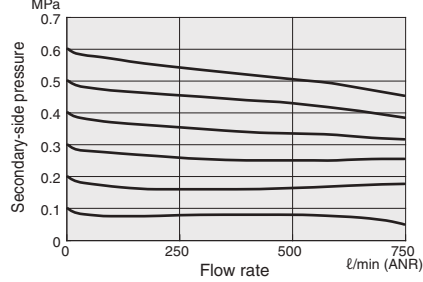
RZ30-M5
RZ32-M5



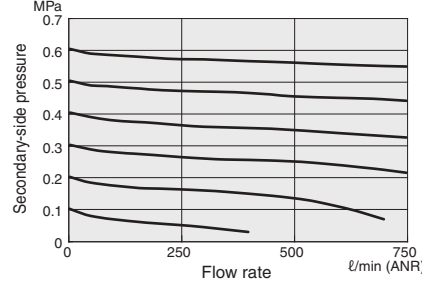
RZ30-01
RZ32-01



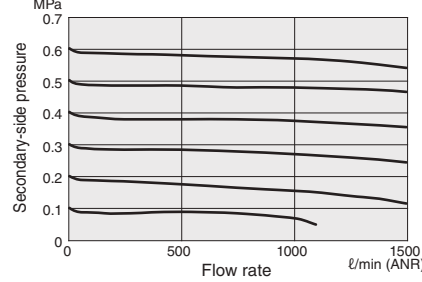
RZ30-02
RZ32-02



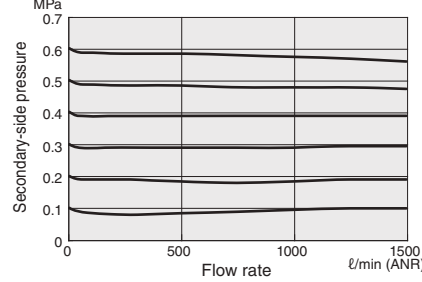
RZ40-01



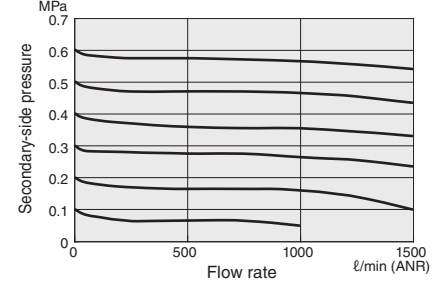
RZ40-02



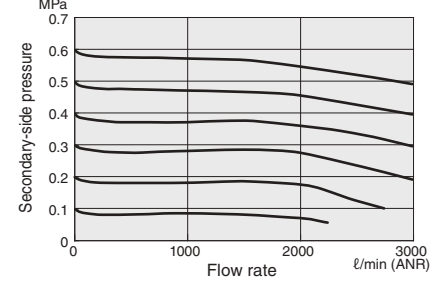
RZ40-03



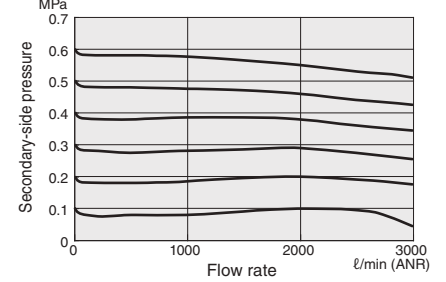
RZ50-02



RZ50-03



RZ50-04

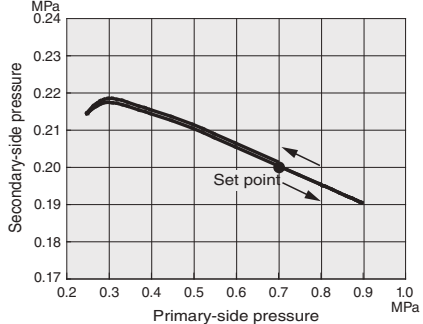


Remarks: Graphs show flow rate characteristics at constant primary-side pressure of 0.7 MPa [102 psi].

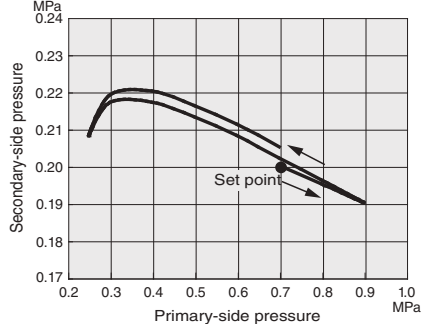
Pressure characteristics

● Standard/Built-in check mechanism

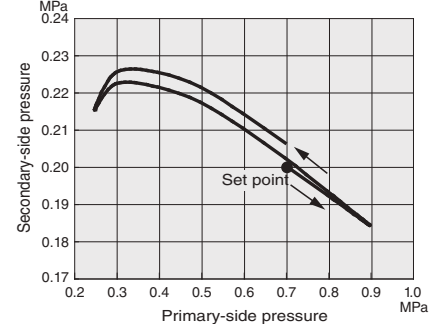
RZ30
RZ32



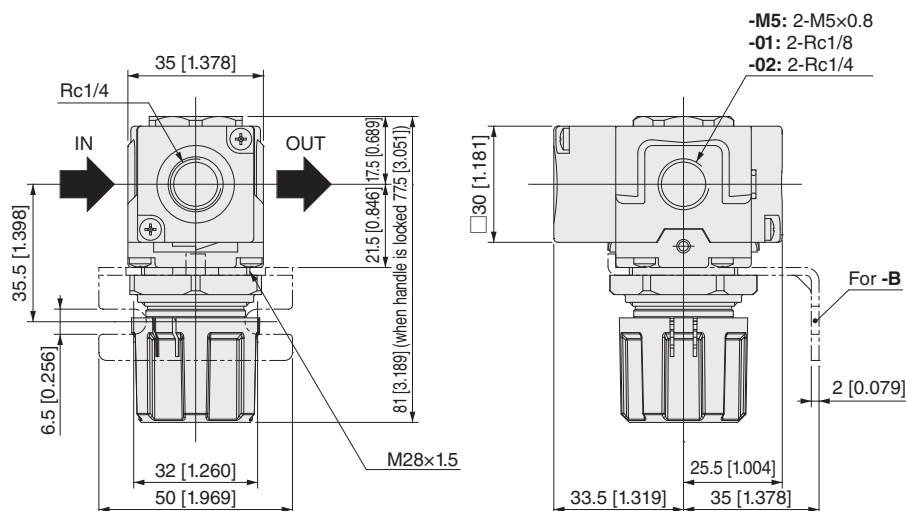
RZ40



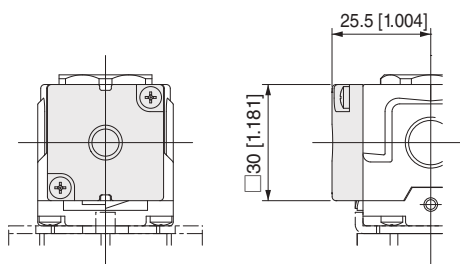
RZ50



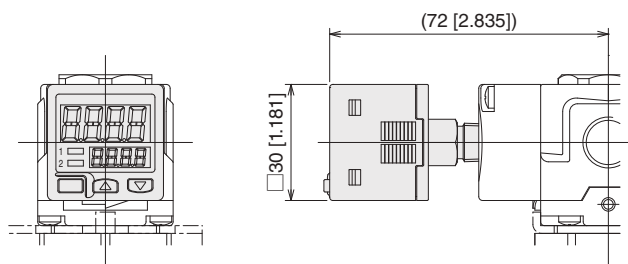
- RZ30
- RZ31
- RZ32



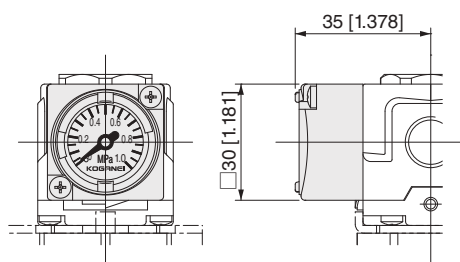
- Pressure gauge option



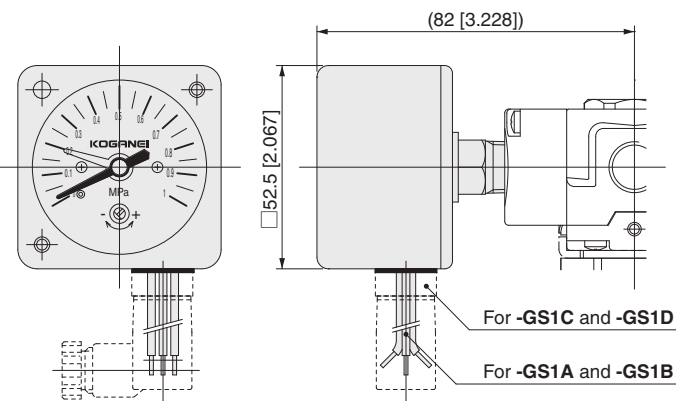
For -GN



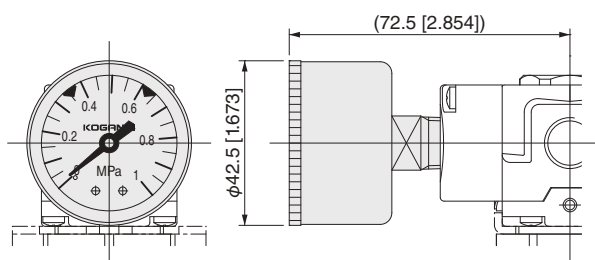
For -GS6



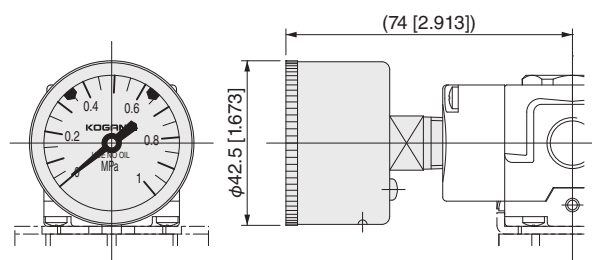
For -G1C, -G4C



For -GS1A, -GS1B, -GS1C and -GS1D

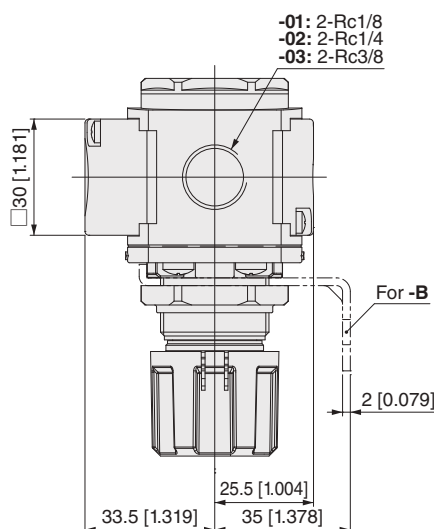
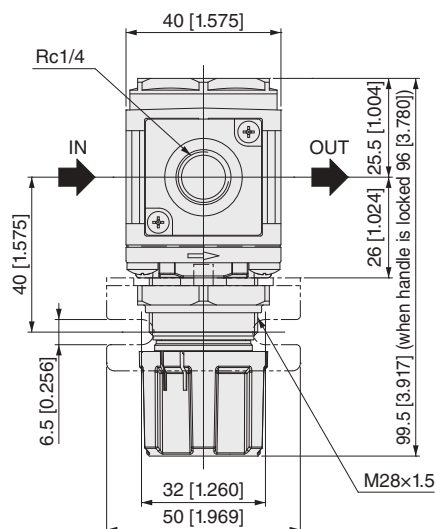


For -G1, -G3

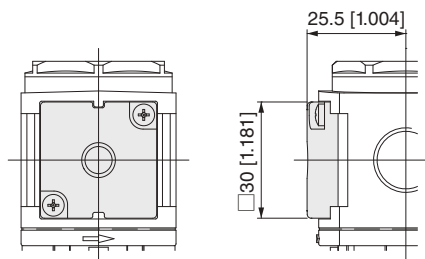


For -G1S, -G3S

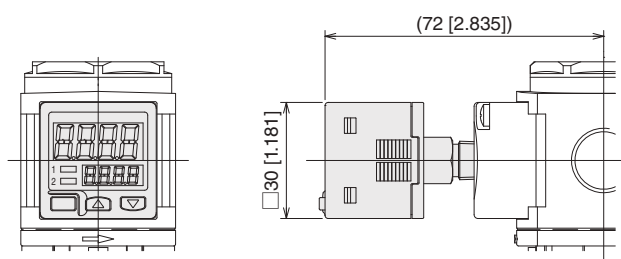
● RZ40
● RZ41



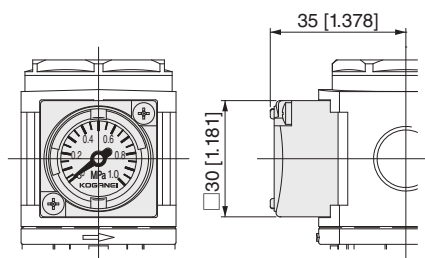
● Pressure gauge option



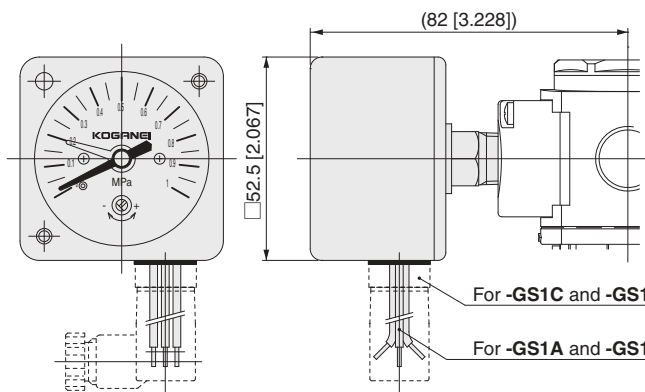
For -GN



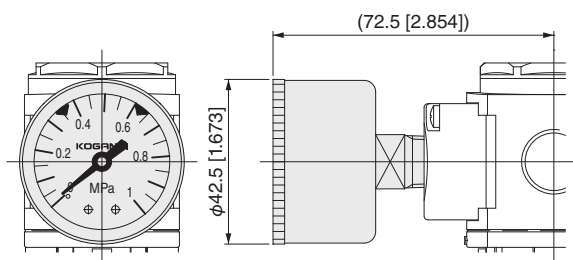
For -GS6



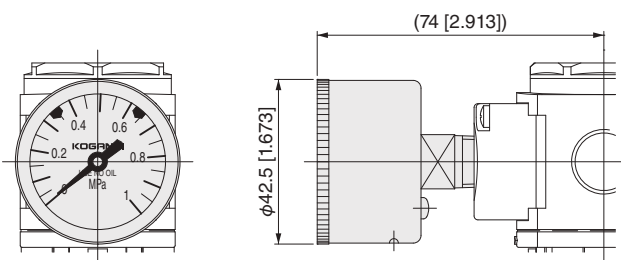
For -G1C, -G4C



For -GS1A, -GS1B, -GS1C and -GS1D



For -G1, -G3



For -G1S, -G3S

CMZ

IBCY
Positive
pressure
specifications

IBCY
Negative
pressure
specifications

FNZ
MFZ
MMFZ

FRZB

FRZ
RZ

Residual
pressure
exhaust
valve

Pressure
switch
module

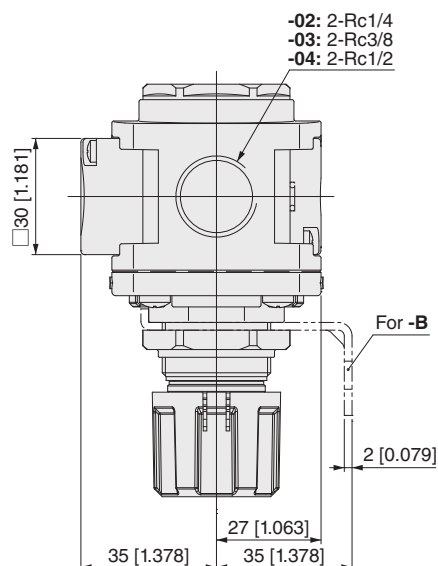
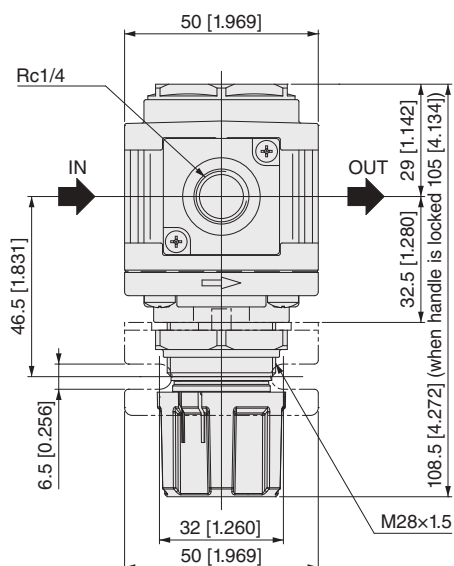
Module
Adapter

Bracket

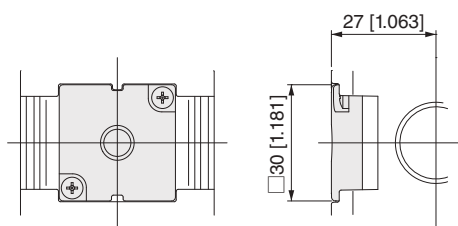
Pressure
gauge

Reference
material

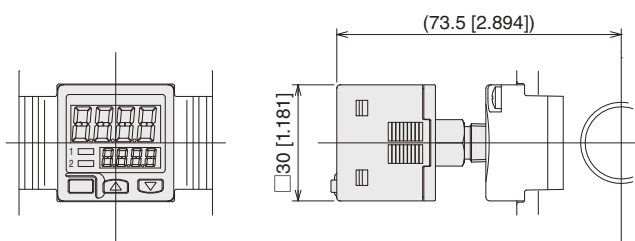
● RZ50
● RZ51



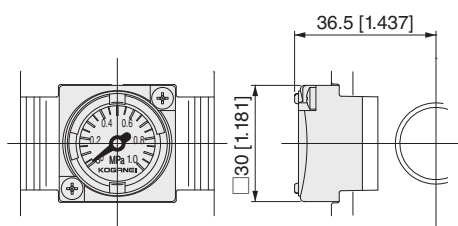
● Pressure gauge option



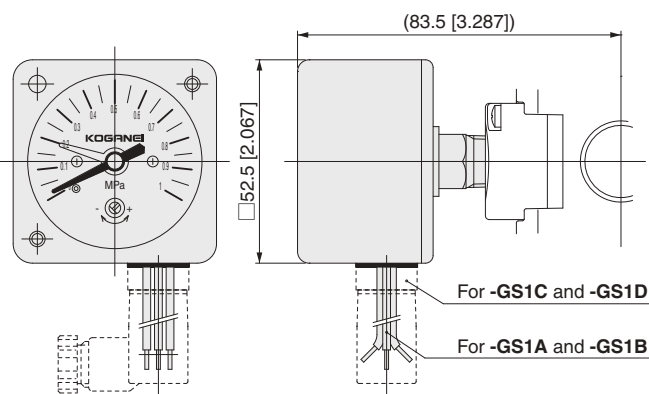
For -GN



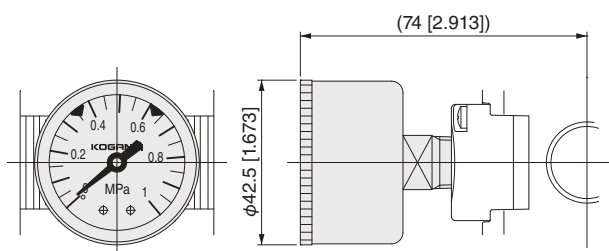
For -GS6



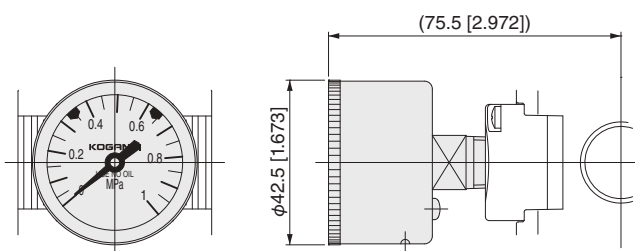
For -G1C, -G4C



For -GS1A, -GS1B, -GS1C and -GS1D



For -G1, -G3



For -G1S, -G3S

Design and selection

● Selection

See the Handling Instructions and Precautions, Specifications, Various Characteristics, Dimensions, and other technical materials for each product to make the correct decision.

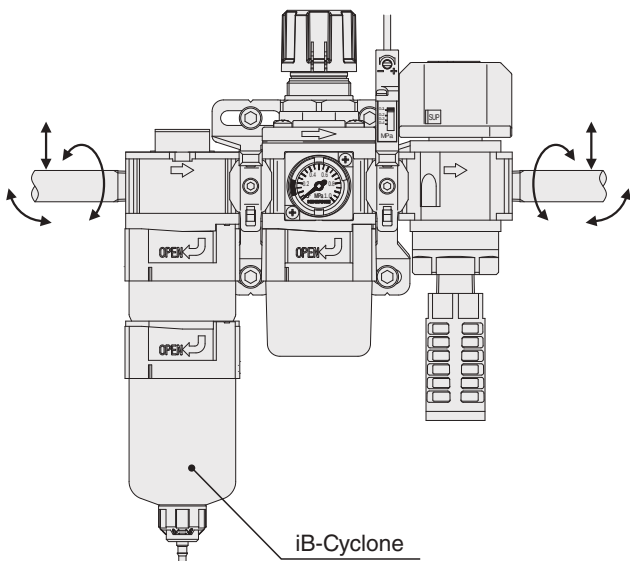
Mounting (installation) and piping

● Mounting (installation) direction, support, and securing

1. The products cannot be mounted (installed) if a bending moment or twisting moment is applied to the product or piping.



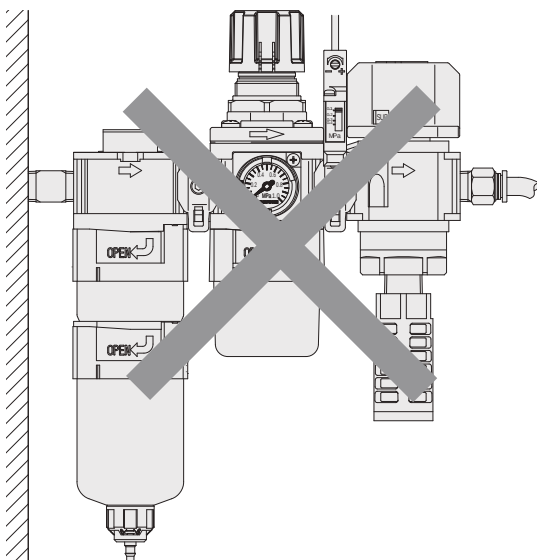
Applying bending moment or twisting moment may damage the product.



2. Do not attach piping so that just one side is fixed as shown in the following diagram. Support external piping separately.



The moment caused by the OUT (secondary) side pipes may damage the product's piping connections.



3. Use the D modules, brackets, etc. to install the products.
4. The product can be mounted (installed) in any direction. It is also possible to install it with the bowl of the filter on top.



5. When mounting (installing) a product, always make sure it is secured and sufficiently supported.



If a product is not securely fixed in place, it can fall over, be dropped, or operate abnormally and cause an injury.

● Maintenance space requirements

Assure there is sufficient space for maintenance inspections and maintenance work. See the dimension diagram for each of the products regarding the maintenance space.



If there is not enough allowance for maintenance space, it will be impossible to remove the bowl assembly and replace the element.



If there is not enough allowance for maintenance space, it will be impossible to do maintenance inspections and maintenance work so the equipment may stop or the product may be damaged.

● Direction of flow

1. Connect the filter regulator or regulator so that the medium flows in the IN port (primary) side and out the OUT port (secondary) side.
2. For filter regulators and regulators, identify the direction of flow of the medium being used by the flow marks on each product. See the "Handling Instructions and Precautions (Filter Regulators, Regulators on page 136) for the relationship of the direction of flow of the medium and the flow marks.



Connecting a product so that the flow of the medium is reversed can damage the product or cause it to stop functioning.

CMZ

IBCY
Positive
pressure
specifications

IBCY
Negative
pressure
specifications

FNZ
MFZ
MMFZ

FRZB

FRZ
RZ

Residual
pressure
exhaust
valve

Pressure
switch
module

Module
Adapter

Bracket

Pressure
gauge

Reference
material

Handling Instructions and Precautions

● Attaching steel pipes and fittings

If steel pipes and fittings are attached to the threaded sections of the aluminum die-cast parts of the product, tighten them to the torque recommended in our standards.



Tightening with excess torque may damage the product or injure workers or operators.

Recommended tightening torque

N·m [ft·lbf]

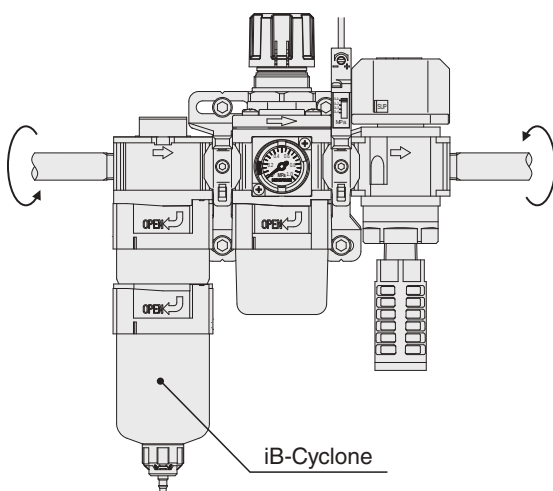
Connecting thread	M5	1/8	1/4	3/8	1/2
Torque	1 to 1.5 [0.738 to 1.106]	4.5 to 6.5 [3.319 to 4.794]	7 to 9 [5.163 to 6.638]	12.5 to 14.5 [9.220 to 10.695]	20 to 22 [14.752 to 16.227]



When mounting the various pressure gauges to a pressure port plate with Rc1/8 or Rc1/4, tighten them to 3.0 to 5.0 N·m [2.213 to 3.688 ft·lbf].



When mounting something, such as a muffler, to the 3(R) port of a residual pressure exhaust valve, tighten it to 1.8 to 2.2 N·m [1.328 to 1.623 ft·lbf].



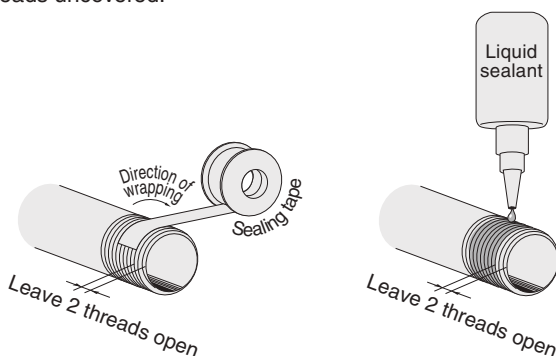
● Preventing contamination by foreign matter

1. Remove all foreign matter, such as metal chips, cutting oil, or dirt, from inside pipes with an air blower (flushing) and thorough washing before fitting the pipes.
2. Do not allow foreign matter, such as metal chips, or sealing tape from the piping threads, to get into the pipes when fitting the pipes.



Foreign matter entering the piping may damage the product or reduce its performance and service life.

3. Wrap the sealing tape in the direction as shown in the diagram below leaving 1.5 to 2 threads uncovered. When using liquid sealant, apply a suitable amount and also leave 1.5 to 2 threads uncovered.



When fitting the pipes, if there is sealing tape or liquid sealant on the end cap of the steel pipes or fittings, the fragments may get into the pipes and cause an air leak.

4. If you are using liquid sealant, do not get it on the bowl of the filter regulator or the front cover of the pressure gauge.



If liquid sealant gets on the parts, it may damage them.

Medium and operating environment

● Usable medium

1. Use cleaned air (using a filter of 5 µm or less) for the medium. Contact the nearest Koganei sales office or overseas department if you are considering using something other than cleaned air.
2. Do not use air that contains moisture or fluids.



Using air that contains moisture and fluids will cause the product's functions to stop after a short period and will reduce the product performance and service life.

3. If air that contains moisture and fluids is used, or if it is possible that they may be mixed in with the air being used, then be sure to install a moisture and fluid removal device (such as iB-Cyclone) on the primary side to reliably remove moisture and fluids.
4. Avoid using media that is prone to extreme pulsating or surging.



Medium prone to extreme pulsating or surging will cause the product's functions to stop after a short period and will reduce the product performance and service life.

● Operating environment

1. Do not use equipment in locations that are subject to direct sunlight (ultraviolet rays); locations with high humidity and temperature, dust, salt, or iron powder.
2. Cover the unit when using it in locations where it might be subject to excessive dust, dripping water, dripping oil, etc.
3. Do not use equipment in environments subject to external vibration or impact.



External vibrations or shocks may result in damage to component parts.

4. Avoid piping that is rigid, such as steel piping, if vibrations are transmitted. Use flexible tubes so that the product is not subject to the vibrations.

● Medium and operating environment

1. The temperature of the medium and the ambient environment must be within the range in the specifications.



Using the product in an environment that is outside the specified temperature or with media that is outside the specified temperature will cause the product's functions to stop after a short period and will reduce the product performance and service life.

2. Do not use media in the product or use the product in an environment that includes corrosive components such as organic solvents, phosphate ester type hydraulic oil, sulfur dioxide, chlorine gas, Freon gas, ozone, acids, alkaline, or in atmospheres or locations with screw lock agents, leak detection fluids, or hot water, or direct exposure to ultraviolet rays. See the reference materials on page 162 for details.



Using the product in an environment or with media that is specified in the above item 2 will cause the product's functions to stop after a short period and will reduce the product performance and service life.

Operation and maintenance inspections

● Method of use

Read the Handling Instructions and Precautions for how to use each product for instructions on correct usage (filter regulators, regulators on page 136 to 140, □30 [1.181] integrated pressure gauge on page 140).

● Maintenance (maintenance inspection)

1. Performance and functions may decrease as the pneumatic equipment ages. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfied, to prevent accidents from happening.
2. Read the Handling Instructions and Precautions for instructions on the correct way to do maintenance and replace maintenance parts (filter regulators and regulators on pages 139 to 140).
3. The product must be disassembled and reassembled to use the seal kit.



Products that have been disassembled and reassembled are not covered by the warranty.



Design and selection

● Pressure settings

1. If the pressure being applied exceeds the set pressure value of the device or equipment that is installed on the OUT port (secondary) side of the filter regulator or regulator, such that it may damage the device or equipment or cause malfunctions, then be sure to install a safety device.
2. We recommend that the OUT port (secondary) side pressure setting be 85% or less of the IN port (primary) side supply pressure.



If the pressure is set to a value exceeding 85%, the pressure on the IN port (primary) side and the flow rate used will be easily affected, causing the pressure on the OUT port (secondary) side to become unstable.

3. It is not possible to use an internal pilot type filter regulator or regulator (applicable models FRZ4□, FRZ5□, RZ4□, RZ5□) with a valve installed on the IN port (primary) side to repeatedly switch the IN port (primary) side pressure.



The OUT port (secondary) side set pressure may fluctuate due to switching of the IN port (primary) side pressure.

4. If air is not consumed for a long time, or if a sealed circuit or balance circuit is used, the pressure on the OUT port (secondary) side may fluctuate. Contact the nearest Koganei sales office or overseas department.
5. Contact the nearest Koganei sales office or overseas department if you intend to use the product in a circuit that requires high-precision pressure adjustment.

● OUT port (secondary) side pressure exhaust and breather hole

1. When reducing the OUT port (secondary) side pressure by turning the handle on the filter regulator or regulator, or when exhausting OUT port (secondary) side pressure when it has risen above the set pressure, the pressure is exhausted to the outside through the breather hole shown in the figure below.

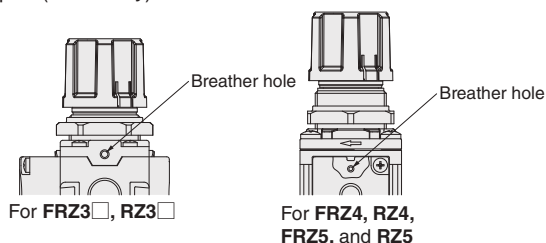


There may be some vibration and noise during exhaust.

2. If sudden pressure increases occur on the OUT port (secondary) side of the filter regulator or regulator, such as are caused by external forces applied to the actuator, then install a separate exhaust mechanism on the OUT port (secondary) side of the filter regulator.



The relief port is smaller than the piping bore, so it may not be able to handle a sudden pressure increase on the OUT port (secondary) side.



● Backflow (residual pressure exhaust) from the OUT port (secondary) to the IN port (primary)

1. To release the pressure from the IN port (primary) of a direct-acting filter regulator or regulator (applicable models FRZ3/RZ3) and process the residual pressure from the OUT port (secondary), select a filter regulator or regulator with a built-in check mechanism (applicable model FRZ32, RZ32).



Depending on the conditions of use, etc., processing residual pressure on the OUT port (secondary) side may not be possible for the standard and low-pressure specifications.

2. For internal pilot type filter regulators and regulators (applicable models FRZ4□, FRZ5□, RZ4□, RZ5□), when the pressure on the IN port (primary) side is released, the residual pressure on the OUT port (secondary) side is processed through the relief port.

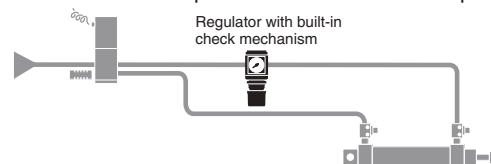


If the volume of the OUT (secondary) side flow path is large, exhaust may take time.

3. If you are using a filter regulator or regulator with a built-in check mechanism (applicable models FRZ32 and RZ32) installed after the valve to adjust the actuator thrust, make sure that the pressure on the OUT port (secondary) side of the filter regulator or regulator with a built-in check mechanism does not rise above the set pressure due to the back pressure of the actuator (as a guide, use an actuator with a difference in pressure of 0.3 MPa [44 psi] or less between the push side and pull side).

<Reference> System upgrade with filter regulator or regulator with built-in check mechanism

Filter regulators and regulators with a built-in check mechanism open the built-in check valve when the IN port (primary) side pressure is lost, thereby disrupting the pressure balance, and the main valve opens instantly to release the OUT port (secondary) side pressure to the IN port (primary) side. Since the thrust force on the push and pull sides of the actuator can be easily changed, air consumption can be reduced by operating the side that does not require thrust force at a lower pressure.

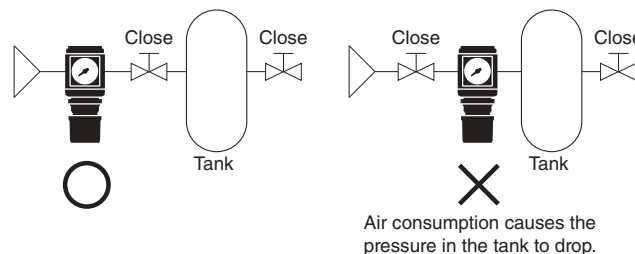


● Moisture and fluid removal

The filter regulator has no function to remove moisture or fluid.

● Air consumption

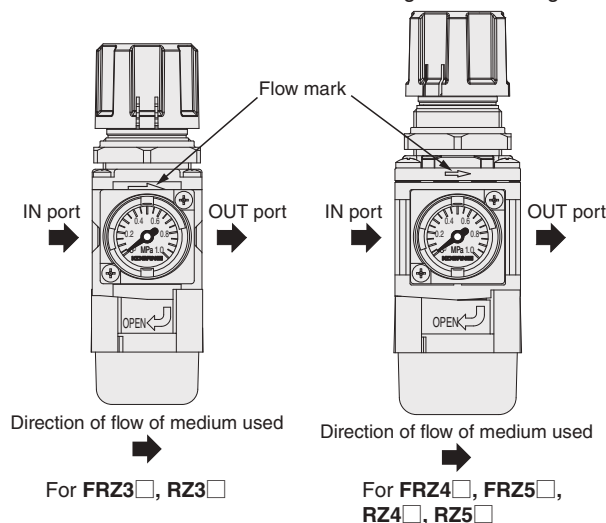
1. Internal pilot type filter regulators and regulators (applicable models FRZ4□, FRZ5□, RZ4□, RZ5□) consume air while regulating the OUT port (secondary) side pressure.
2. Air consumption varies depending on the relationship between the pressure on the IN port (primary) side and the pressure on the OUT port (secondary) side.
3. Internal pilot type filter regulators and regulators (FRZ4□, FRZ5□, RZ4□, RZ5□) if the IN port (primary) side and OUT port (secondary) side are sealed, the pressure will drop due to air consumption.



Mounting (installation) and piping

● Flow mark

The following diagram shows the relationship of the direction of flow of the medium and the flow mark on filter regulators and regulators.



CMZ

IBCY

Positive
pressure
specifications

IBCY

Negative
pressure
specifications

FNZ

MFZ

MMFZ

FRZB

FRZ

RZ

Residual
pressure
exhaust
valve

Pressure
switch
module

Module
Adapter

Bracket

Pressure
gauge

Reference
material

Handling Instructions and Precautions



● Piping work

Connect pipes and fittings to the filter regulator or regulator IN ports and OUT ports so that the weight and torque of the pipes do not affect the product. When tightening the piping, hold the main unit and tighten it to the torque recommended on page 135.



Applying unnecessary force or impact to the handle, bowl assembly, or pressure gauge may damage component parts.

● Installing brackets

To install brackets, do it in the following order.

1. Remove the handle.
(See "Removing the Handle" on page 138 for instructions on how to remove the handle.)
2. Install the bracket.
3. Screw on the mounting ring.



Tighten the mounting ring to 5.0 N·m [3.688 ft·lbf] or less.

4. Install the handle.
(See "Installing the Handle" on page 138 for instructions on how to install the handle.)

● Panel mount

1. The diameter of the mounting hole in the panel for all sizes of filter regulators and regulators is $\phi 28.5$ mm [1.122 in.].
2. See the following table for the thicknesses of the panels.

mm [in.]

Model	FRZ3□ RZ3□	FRZ4□ RZ4□	FRZ5□ RZ5□
Thickness	3 [0.118] or less	7 [0.276] or less	



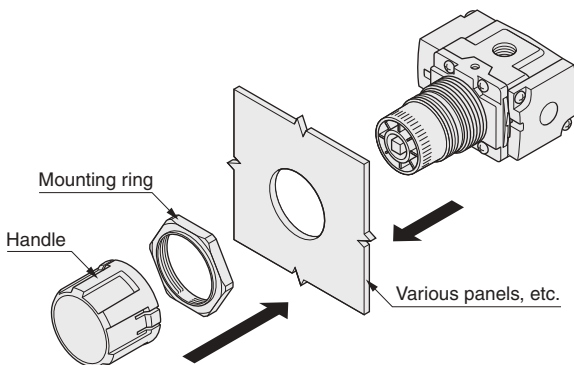
Using panels that are thicker than specified will cause panels to not be securely fastened with the mounting rings or reduce the visibility of the yellow caution ring.

3. To install panel mounts, do it in the following order.
 1. Remove the handle.
(See "Removing the Handle" on page 138 for instructions on how to remove the handle.)
 2. Install the filter regulator or regulator to the panel.
 3. Screw on the mounting ring.



Tighten the mounting ring to 5.0 N·m [3.688 ft·lbf] or less.

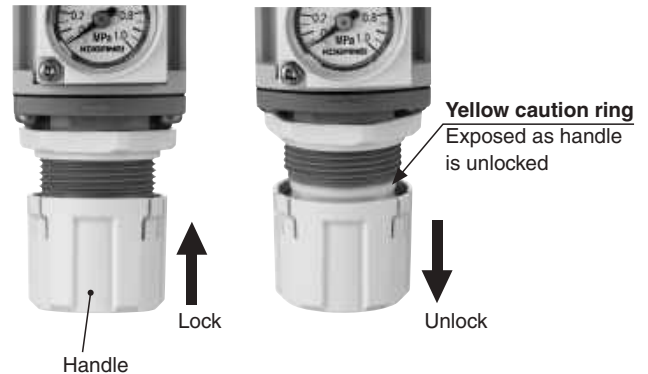
4. Install the handle.
(See "Installing the Handle" on page 138 for instructions on how to install the handle.)



Operation and maintenance inspections

● Locking and unlocking the handle

1. The handles on the filter regulators and regulators have a push-lock mechanism. Use the procedure shown below to lock and unlock the handle.



2. The handle must be unlocked to adjust the pressure.



Turning the handle while it is locked may cause damage to component parts.

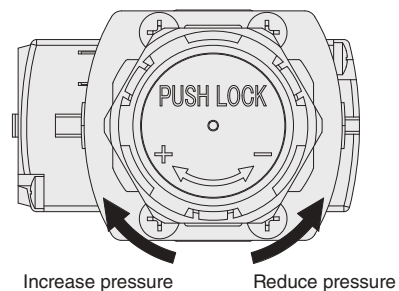
3. After adjusting the pressure, lock the handle.

● Pressure adjustment

1. To adjust the pressure, turn the handle in the "+" direction as indicated on the bottom of the handle as shown in the diagram below to increase pressure, and turn the handle in the "-" direction to decrease pressure.



If you turn the handle too far, it may cause damage to internal parts or cause them to stick, making the handle harder to turn. Be careful not to turn it too far.



2. When adjusting the pressure, start from the low pressure side and adjust to the desired setting pressure. If you exceed the desired pressure, lower the pressure and then adjust to the desired setting pressure again from the low pressure side.



If you adjust the pressure to the desired setting from the high pressure side, it may cause the pressure on the OUT port (secondary) side to become unstable.

3. When adjusting the pressure, check the pressure on the IN port (primary) side and OUT port (secondary) side by using a pressure gauge or other device.
4. Even though the handle can be turned to the "+" side maximum value, which increases the pressure beyond the upper limit of the set pressure range, you need to keep the pressure within the set pressure range while you adjust it.

● Removing the handle

To remove the handle, do it in the following order.

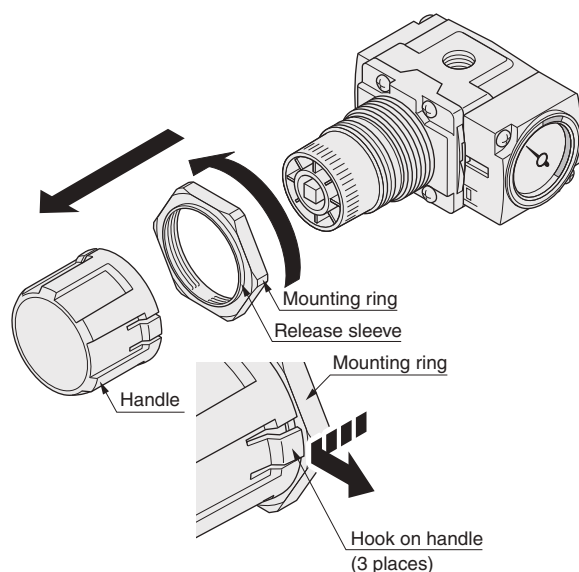
1. Unlock the handle.
(See "Locking and unlocking the handle" on page 137 for instructions on how to lock/unlock the handle.)
2. Turn the mounting ring counterclockwise (in the direction of the arrow in the figure below).

NOTE Turn the mounting ring until it comes off the threads.

3. Pull the mounting ring towards the handle.

NOTE Pull the release sleeve of the mounting ring until it pushes open the claws (3 positions) on the handle.

4. Pull off the handle and mounting ring together.



● Installing the handle

1. To install the handle, do it in the following order.

1. Release the pressure on the IN port (primary) side to atmosphere.
2. Screw on the mounting ring.

NOTE Installing the handle before screwing in the mounting ring will cause the mounting ring to become unattachable or the handle to become difficult to remove.

3. Push the handle in until the yellow caution ring is no longer visible.

NOTE Before pushing the handle in, align the □ shape on the adjusting assembly (see exploded view on page 139) with the □ hole shape on the bottom of the handle.

2. If the handle is attached while pressure is supplied to the IN port (primary) side of the filter regulator or regulator, the OUT port (secondary) side pressure may temporarily increase. If a temporary increase in the OUT port (secondary) side pressure can cause damage or malfunction of the OUT port (secondary) side equipment or devices, be sure to release the IN port (primary) side pressure to the atmosphere before attaching the handle.

NOTE Doing so can damage the product or injure workers or operators.

3. Before attaching the handle, check that the temporary increase in pressure on the OUT port (secondary) side will not affect equipment and devices downline if the pressure on the IN port (primary) side cannot be released to the atmosphere.

● Interchangeable □30 [1.181] integrated pressure gauge and pressure port plate

When rotating the □30 [1.181] integrated pressure gauge 180° or when interchanging a □30 [1.181] integrated pressure gauge or a pressure port plate, do it in the following order.

1. Remove the two small retaining screws.
2. Remove any metal chips from the female threads, such as by using an air blower.

NOTE If there are any metal chips left, they can damage the screw threads or the metal chips might stick to the O-ring, causing air to leak.

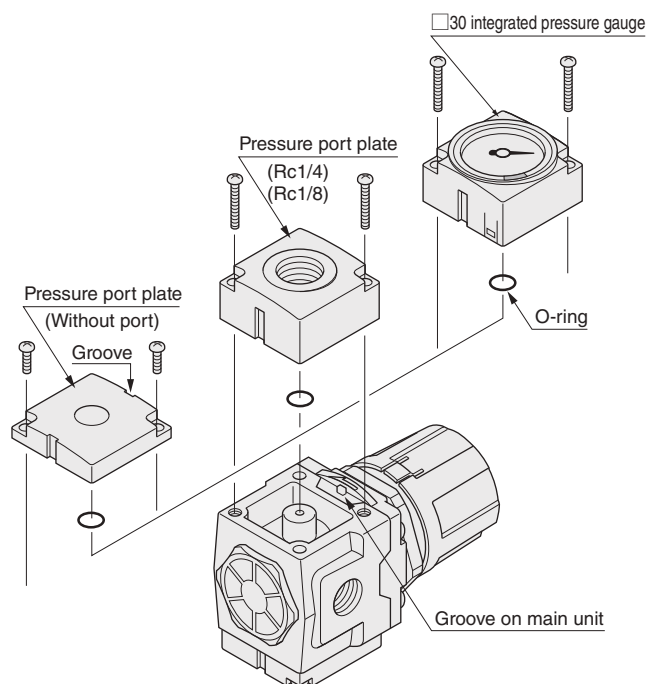
3. Install the O-ring on the □30 [1.181] integrated pressure gauge or pressure port plate.

NOTE Not assembling the O-ring will result in air leaks.

4. Align the notches on the □30 [1.181] integrated pressure gauge or the pressure gauge port plate with the protrusions on the main unit to assemble them.

5. Tighten the two small retaining screws to a torque of 0.9 to 1.1 N·m [7.966 to 9.736 in·lbf].

NOTE Tightening to a torque that exceeds the specified value can cause the screw head or bit to break or damage the component parts. Tightening to a torque that is less than the specified value might allow the screws to loosen and let air leak out.



CMZ

IBCY
Positive
pressure
specifications

IBCY
Negative
pressure
specifications

FNZ
MFZ
MMFZ

FRZB

FRZ
RZ

Residual
pressure
exhaust
valve

Pressure
switch
module

Module
Adapter

Bracket

Pressure
gauge

Reference
material



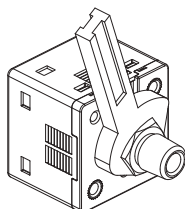
Filter regulator Regulator

● Installing included options

1. When attaching the various pressure gauges and other things, be sure to tighten them by using a tightening tool on the square or hexagonal parts of the ports.



Holding the main body of the various pressure gauges as you tighten them can cause damage to their component parts.



2. When mounting the various pressure gauges to a pressure port plate with Rc1/8 or Rc1/4, tighten them to 3.0 to 5.0 N·m [2.213 to 3.688 ft·lbf].



Tightening to a torque that exceeds the specified value can cause damage to the component parts. Tightening to a torque that is less than the specified value might allow the screws to loosen and let air leak out.

3. The female threaded part of the pressure port plate with Rc1/8 or Rc1/4 has a stopper.



Tightening it more after it hits the stopper, can cause damage to the component parts.

● Replacing the pressure port plate, handle, mounting ring

1. To replace the pressure port plate, see "Replacing the □30 [1.181] integrated pressure gauge and pressure port plate" on page 138.
2. To replace the handle and mounting ring, see "Removing the handle" and "Installing the handle" on page 138.

● Replacing the seal kit, element, and bowl assembly

1. To replace the seal kit, element, and bowl assembly, remove the filter regulator or regulator and do the work on a work table.
2. Apply grease to the seal materials, such as the O-rings (but not the diaphragm) that are used on the filter regulator or regulator.
3. Contact the nearest Koganei sales office or overseas department if you are considering re-applying grease to the O-rings. Recommended grease: Lithium soap base No. 2 equivalent
4. Periodically replace the element of the filter regulator.



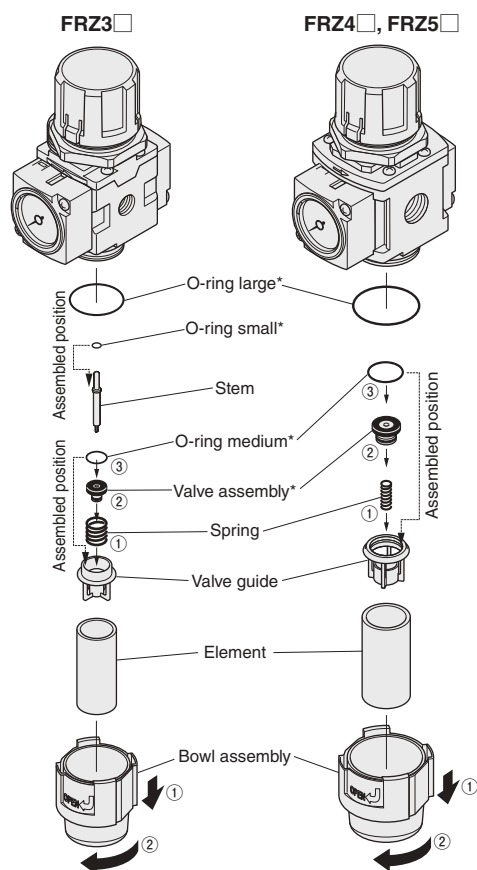
The service life of the element varies depending on the quality of air supplied to the IN port (primary) side. If the air supplied to the IN port (primary) side is highly contaminated with foreign matter, install a prefilter on the IN port (primary) side or change the air filter frequently. As a guideline, the replacement time for the element is one year after starting to use it.

5. When replacing the seal kit, element, and bowl assembly, be careful not to lose component parts.
6. See the diagram at right to replace the seal kit, element, and bowl assembly.



Always assemble the component parts correctly.

Bowl side of filter regulator

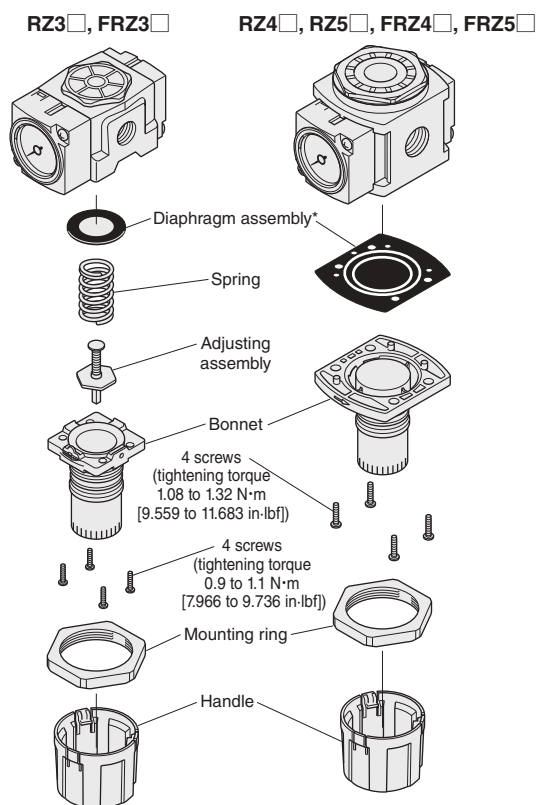


The * mark indicates component parts of the seal kit.



Products that have been disassembled and reassembled are not covered by the warranty.

Handle side of regulator, filter regulator

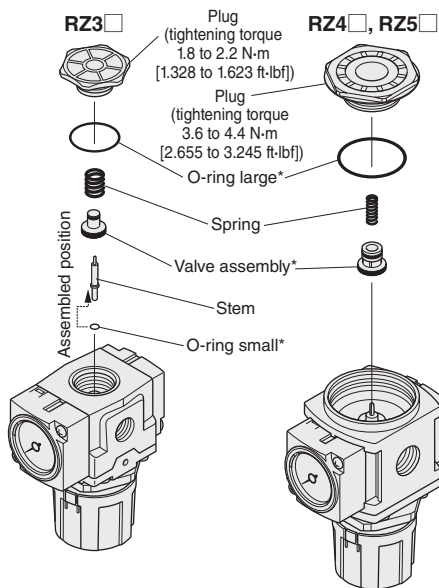


The * mark indicates component parts of the seal kit.



Products that have been disassembled and reassembled are not covered by the warranty.

Plug side of regulator



The * mark indicates component parts of the seal kit.



Products that have been disassembled and reassembled are not covered by the warranty.



□30 [1.181] integrated pressure gauge

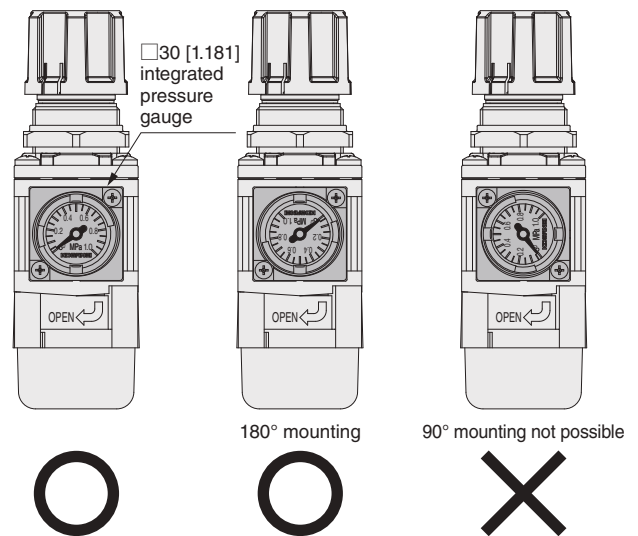
Mounting (installation) and piping

● Mounting (installation)

- When installing the □30 [1.181] integrated pressure gauge to a filter regulator, refer to "Replacing the □30 [1.181] integrated pressure gauge and pressure port plate" on page 113.
- When installing the □30 [1.181] integrated pressure gauge to a filter regulator or regulator, install it in the orientation shown in the diagram below.



The □30 [1.181] integrated pressure gauges can be installed by rotating them to a 180° orientation, but they cannot be installed by rotating them to a 90° orientation.



Medium and operating environment

● Pulsation, vibration, impact

The □30 [1.181] integrated pressure gauge is a precision device. It cannot be used if the medium being used pulsates or if it is subject to vibration or impact from outside.



Pulsating of the medium being used, or external vibrations or impacts may result in damage to component parts.

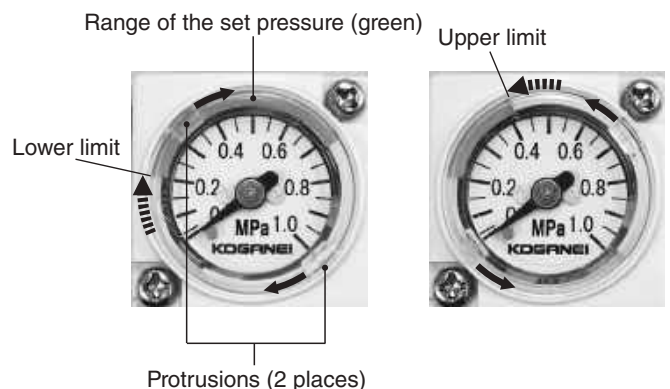
Operation and maintenance inspections

● Adjusting the range of the set pressure

- Adjust the range of the set pressure (green area) in the following order.
 - Adjust the lower limit of the set pressure range by rotating the protrusions (2 places) clockwise by hand.
 - Adjust the upper limit of the set pressure range by rotating the protrusions (2 places) counterclockwise by hand.



Adjusting the set pressure range with tools, etc. can damage the component parts.



See page 154 for the specifications and dimension diagrams for the □30 [1.181] integrated pressure gauge.